

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY REGION IX LABORATORY 1337 S. 46TH STREET BLDG 201 RICHMOND, CA 94804-4698

MEMORANDUM

SUBJECT: Field Audit Report

Groundwater Monitoring Program, George Air Force Base, CA

FROM: Greg Nagle, Environmental Scientist

EPA Region 9 Laboratory (PMD-2)

THROUGH: Brenda Bettencourt, Director

EPA Region 9 Laboratory (PMD-2)

TO: James Chang, Remedial Project Manager

Superfund Division (SFD-8-1)

Attached is a split sample report for sampling performed the week of April 10th, 2006. This report details observation made during the groundwater sample collection process.

If there are further questions concerning this field-sampling audit, please call Greg Nagle at (510) 412-2334.

ATTACHMENT: Field Audit Report

George Air Force Base Basewide Groundwater Monitoring Program April 2006 Field Audit Report

Introduction:

On April 10th, 11th, and 12th of 2006, Greg Nagle of the USEPA Region 9 Laboratory Field and Biology (FAB) team performed a field audit of groundwater sampling procedures in support of the George Air Force Base Groundwater Monitoring Program. Mr. Nagle also obtained split samples during the course of the field audit. The EPA FAB team conducted the field audit and split sampling in accordance with the following documents:

Basewide Sampling and Analysis Plan (SAP), George Air Force Base, California HydroGeoLogic 1998.

Final 2003 Annual Sampling and Analysis Plan (SAP) Addendum Basewide Groundwater Monitoring Events, Operable Units 1, 2, and 3 George Air Force Base, California MWH Americas, Inc. July 2003.

Final Split Sampling Plan (SSP) Basewide Groundwater Monitoring Program, George Air Force Base, Victorville, California. (EPA Region 9 Field and Biology Team, April, 2006.)

The FAB team identifies deviations from the project planning documents referenced above as findings in accordance with the following criteria:

- 1. Procedure not performed as specified in plan.
- 2. Procedure performed inconsistent with procedure specified in plan.
- 3. Appropriate procedure performed, procedure not specified in plan.
- 4. Inappropriate procedure performed.

Audit Participants:

Project Management

Sam Grizzle – Site Manager, Montgomery Watson Harza (MWH)

Field Support Personnel

Cole Munson – Principal Owner/Lead Sampler, M&M Environmental Marlin Ellis – Sampler, M&M Environmental

EPA Auditors

Greg Nagle – USEPA Region 9 Laboratory Joe Eidelberg – UESPA Region 9 Quality Assurance Office (QAO)

The EPA auditors observed sampling procedures and obtained split samples at the following locations as specified in the SSP.

Well ID	<u>Parameters</u>	Description
FT-03	VOCs	OU 1/OU 3/FT-19 Upper Aquifer
MW-49	VOCs	OU 2/OU 3 Upper Aquifer
MW-69	VOCs	OU 2/OU 3 Upper Aquifer
NZ-27	VOCs	OU 1 Upper Aquifer
NZ-89	OCPs	OU 3 Upper Aquifer
NZ-107	VOCs, LF Surrogates	OU 1/OU 3 Lower Aquifer - Landfill
WZ-06	VOCs, Nat Att. Par	OU 3/Site OT-51 Upper Aquifer

Notes:

VOCs – Volatile Organic Compounds

LF – Landfill Surrogates (i.e., Chloride, Nitrate, Sulfate)

Nat Att. Par. – Natural Attenuation Parameters (Total Organic Carbon, Alkalinity, Nitrate, Total Dissolved Solids)

OCPs – Organochlorine Pesticides

Procedures

M&M collected all samples using the same portable submersible pump and control box. M&M calibrated field instruments, calculated purge volumes, followed sample collection/preservation protocols, and performed necessary decontamination procedures in between wells as specified in the planning documents. In so doing, M&M was able to collect sample from 3-4 wells per day.

MWH provided M&M with direction, answered questions, and reviewed paperwork during the course of sampling activities to ensure efficiency and adherence to plan specifications. MWH packed the coolers, filled out air bills, and delivered samples for overnight delivery. The laboratory received all samples within 24 hours of collection, at 4° C without incident.

Photographs, field logs, and chain-of-custody information gathered during the course of audit activities are presented as Exhibit A, B, and C respectively. Identified below are general and specific audit findings with recommendations for corrective action. None of the findings listed impact sample integrity.

General Findings:

- The projects' contract laboratory, Applied Physics and Chemistry Labs (APCL), Chino California unexpectedly announced it would no longer accept samples for environmental analysis effective April 1st, 2006. MWH is sending samples to EMAX Laboratories, Torrance, California. MWH reportedly audited EMAX within the last year for other projects. EMAX has experience with the US Air Force analytical requirements and data deliverables.
- 2. One field team (2 employees') of M&M Environmental unexpectedly quit immediately prior to the field audit. At the time of the field audit, M&M Environmental employed one very experienced sampler and one sampler in training.

Specific Findings:

- 1. Field personnel failed to perform a calibration check for well stabilization parameters (i.e., pH, conductivity, turbidity and dissolved oxygen) at the end of the day on April 10th, 2006 as specified in Section 7.1.1.1 of the Basewide SAP (HydroGeologic, 1998).
- 2. At MWH's direction, field support personnel did not purge well WZ-06 using the Micro-Purge/Modified Micro-Purge procedure specified in section 6.1.1.1.2 of the Basewide SAP (HydroGeologic, 1998). Instead, MWH directed field personnel to place the pump one foot from the bottom of the well, and pump at a rate of approximately 1.5 gallons per minute (gpm) to purge roughly 75 gallons. When the water level recovered, pumping continued at a rate of approximately 0.25 gpm. Sample collection occurred upon stabilization of field parameters as specified 7.1 of the Basewide SAP Addendum (MWH, 2003). MWH modified this purge technique based on experience and data generated from previous sampling events.
- 3. The EPA QAO did not provide performance evaluation samples (PES) for all the chemical testing parameters as specified in the SSP. The QAO provides PES through Quality Assurance Testing Support (QATS) Contract Laboratory in Las Vegas, Nevada. EPA and the USAF field personnel submitted PES for volatile organic compounds, nitrate, and alkalinity only. The QATS Laboratory provided a PES for total organic carbon (TOC) as requested, however the container type and chemical preservative was inconsistent with that used by the field and specified in the SSP thus compromising the "double blind" PES submission. QATS provided the PES as directed by EPA.

Recommendations:

- 1. MWH should perform an audit of EMAX Laboratories and communicate any project specific requirements as soon as possible. Given the recent closing of APCL, EMAX may be experiencing a significant influx of work from other projects.
- 2. Given the recent turnover in sampling support at M&M Environmental, and to a lesser degree Specific Finding 1, MWH should continue to provide on-site oversight support.
- 3. MWH should provide justification for the modified purge approach used at WZ-06 and document the procedure in an addendum to the Basewide SAP.
- 4. The EPA QAO should provide PES as specified in the SSP, or communicate changes with field personnel in advance of field sampling activities.

Exhibit A

Photographs



Measuring Water Depth



Setting the Pump



Collecting Sample



Disposing Purge/Decon Water

Exhibit B

Field Logs



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Walnut Creek, CA 94597	

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Odor: None Low Medium High Fuel-like Other (describe): Comments:		اء '			OBSERV	ATIONS OF G	ROUNDWAT	ER SAMPLES	98999		
Comments:	Color:	d	lestr	Other (desc	rlbe):						
	Odor:	N	eno	Low	Medium	Migh	Fuel-like	Other (des	cribe):		
	Comments										
				9				9777		jg "	
			69			- 588			10-1		-
			87					70010000			12-01 GAF

 	- 3 3-3				200			10]	,
(I) N	TWH NTGOMERY WATSO) ная г а		NITORING W				Page	_of /
All measure	ments taken	from: 🌠 To	op of Casing	Protective	Casing E	Ground Leve	I Sample ID	NZ-X	2-WG
Nell Numbe	J 7 "	-89				er Level (ft)	121.7	72	
Date6	4-11	-06	,		Depth to P	roduct (ft)	N/	4	
rime Start:_	1540	En	d: 110		Total Well	Depth (ft)	128.5		
Client AFC	EE				Standing V	Vater Column (m <u>6.</u>	78	
Project Gear	rge AFB Base	wide Ground	water Monitori	ng	Purging M	ethod <u>Modified</u>	Micropurga		
	mun		ELLIS.	323	Purging Ed	quipment 2' Gr	undios Redifi	ow	
Well Diamet	2011		e Diameter	8"	Waler Lev	el Equipment_	SOLIX	155	
Screen Inter	160		.5	*	Field Para	meter Meter_	HORI	BA U	1-10
Pump Depth	n (ft)	125./1	<i>t</i>		ORP Mete	, H	ANNA.		
				FIELD	PARAMETI	RS MEASUR	ED		
1—1920.	AMOUNT		5%	1%	5%	10% or <10	5%	10%	
TIME	PURGED (gallons)	Purge Rate (gpm)	EC (mS/cm)	рН	Temp (°C)	Turbidity (NTU)	ORP (mv)	DO (mg/L)	Water Level (ft)
1040	Sta	itu	ell	Dura	2 at	1.48	Gpm		12172
1045	443	.40	7.91	7.921	18.6	11	266	6 39	121.75
1050	6.72	.27	7.72	7.92	20.5	_9	232	6.63	121.73
10 55	8.84	1.27	1958	7.93	21.3	10	237	588	121.75
1100	10.80	140	.963	7.94	21.3	10	237	583	121.75
1105	12.13	.36	.962	7.94	21.3	8	239	5.85	121.75
1110	Coll	ect?	Some	Le.	6-0000		300 30 50		
			/						
10200									
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	<u> </u>	<u> </u>			a.				<u>}</u>
				1000000					
	<u></u>	<u> </u>		<u></u>					
				FIELD SCREE	NING ANAL	7515	-		30.75
Parameter	Method/inst	rument M	easurement 1	Measureme	nt 2 Av	erage Measure	ment Da	te/Time	Sempler
H₂S		!		9					
Fe ²⁺			92.00 15-00						
		550 - 550	OBSERV	ATIONS OF GI	ROUNDWAT	ER SAMPLES			
Colar:	Clear	Other (desc	orlbe):			energenteel eer			
Odor:	None	Low	Medium	High	Fuel-like	Other (desc	ribe);		
Comments									
		8				3 <u>-100408</u>			
38	#I (A)								
						• • •	103.55		
20,200,000									12-01 GAFE

Alt measurer Well Numbe	vra <i>omenywatso</i> ments taken l	, [~] +				LING LOG			**************************************
		Irom: 🗀 10	p of Casing	Protective	e Casing	Ground Leve	el Sample ID	mw-6	59-W6
TACH LACHLING	mw;	69	<u> </u>		Static Water	er Level (fl)	125.70	2	
Date	4/11/	06	<u></u>	22	Depth to Pr	roduct (ft)	₩		. W .
Time Start:_	1425	Enc	1: 150	572	Total Well (Depth (ft)			-
Client AFC	EE		•		Standing W	/ater Column	(ft) /5	۷.3	
Project Geor	ge AFB Base	wide Groundy	valer Monitori	ng	Purging Me	thod Modified	Micropurge		
Sampler(s)	7 1	50N-	15 1 1 1	ŝ	Purging Eq	uipment_2' Gr	undfos Redifi	ow	
Well Diamet	er_ 5/ '/	r Borehole	Diameter_	12"_	Water Leve	el Equipment_	Solin	57	
Screen Inter	val 12		'o'		Field Parar	meter Meter_		757	4-10
Pump Depth		37.0	130.7	<u></u>	ORP Meter	·	HANX	14	
				FIELD		RS MEASUR	13		
	AMOUNT PURGED		5%	1%	5%	10% or <10	5%	10%	
TIME	(gailons)	Purge Rate (gpm)	EC (mS/cm)	рH	Temp (°C)	Turbidity (NTU)	ORP (mv)	(mg/L)	Water Level (ft)
1425	Big	an h	rell,	surge	2 (6) .	32 G	Pm_		_
1436	3.96	.72	1-17	7.90	20.2	25	258	5.30	125.95
1435	4.72	-30	1.18	7.84	20.7	12	252	4.35	125.82
1440	5.49	.28	1.17	7.82	21.7	11	242	4.55	125.95
1445	701	.26	1.18	7.82	22.5	18	240	7,59	121.95
1450	8.5%	.26	1.18	7.79	232	13	341	4.47	125,95
1455	9.63	. 21	1./8	7.79	23.6	8	250	4.40	125.95
1500	Col	ect	Jan	nply) 		81	-	
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- 4									į.
	- 52 - 15	-	3		8	 		1	
				FIELD SCREE	NING ANALY	SIS	§		
Parameter	Method/Instr	rument Me	asurement 1	Measureme	nt 2 Ave	гада Меаѕилы	ment Da	te/Time	Sampler
H ₂ S	:						1		
Fe2+								i	
	D		OBSERV	ATIONS OF GE	ROUNDWATE	R SAMPLES			60707
Color:	Clear	Other (descr	lbe):				18		
Odor:	Norte	Low I	Medium	High	Fuel-like	Other (desc	ribe);		
Comments:							20	7. e	
		-							2) (3)
									83
					4				12-01 GAFI



Date: 4/2/08 Project: LT GLIST at W2-06 D845 Stated well Purce at 1.46pm Auntil well Pumps dry Calibration Flutd Manufacts Calibration Flutd Manufacts Calibration Flutd Manufacts Pumps dry Calibration Flutd Manufacts Pumps dry Dissolved Oxygen (mg/L) Dissolved Oxygen (mg/L) 1015 Calleted Aample State de 1170 Oxygen Complete Depart 1470 Oxygen Complete Loverd 1475 Callet Sample State 1476 Callet Sample State 1476 Callet Sample State 1477 Callet Sample State 1478 Callet Sample Stat	er and Lot#s Actual Value		
D815 arrived at W2-06 D845 Started well Present at Site! McLA Purce at 1.46Pm Audit well Quito Calibration Fluid Manufactu O935 Aumpet 75 god hoset pump to 121 and restarted purce at mornal purce hate 1015 Callested sample Start de 1115 Decan Complete Depar 1130 arrived at mors 1435 Decan Complete Lowerd 1435 Decan Complete Lowerd 1435 Decan Complete Lowerd 1445 Started well purces	07-0 Actual	4974	
OS 45 Startal well Present at Site! MELLA Purce at 146000 Description Fluid Manufacture Or Unite well Present at Site! MELLA Calibration Fluid Manufacture Or Unite well OutoCal English Description Time: ph (SU) Purce At normal Purce Start de 1015 Callested sample Start de 1115 Decar Complete Depar 1230 arrand at how 49 - Start 1435 Decar Complete lowerd 1435 Decar Complete lowerd 1435 Decar Complete lowerd	07-0 Actual	4974	
D845 Started well Present at Ster Mich Purce at 1.46000 Day Callbration Fluid Manufacture of United well Calibration Fluid Manufacture of United Well Calibration Fluid Manufacture of United Well Experience to 101 Calibration Time: Day Day Day Description of EC (molenn) Day Day Day Dissolved Oxygen (mg/L) 1015 Callested Sample Start de 1115 Decar Complete Depare 1130 arrand at Thus 49 - 86 at 1148 Decar Complete Lowerd 1495 Started well purge	07-0 Actual	4974	
Purce at 1.46000 Discovered Total Or Unite well Pumps dry Outo Calibration Fluid Manufactur Outo Call End. Discovered Tomos Paral at normal Purce at normal Purce at normal Purce hats Dissolved Oxygen (mg/L) 1015 Callested sample Start de 1115 Decan Complete Depare 1430 arrand at normal 1435 Decan Complete lowerd 1435 Decan Complete lowerd	07-0 Actual	4974	
Or until well Calibration Fluid Manufactur Pumps dry Calibration Fluid Manufactur Description Time: And restarted phi (SU) Paral at normal EC (ms/cm) Purise hate Dissolved Oxygen (mg/L) 1015 Callested sample Start de 1115 Decar Completo Depar 1130 arrest at mus 49 - Star 1436 Decar Complete lovered 1438 Decar Complete lovered	07-0 Actual	_	
Or until well Calibration Fluid Manufactur Pumps dry Calibration Fluid Manufactur Description Time: And restarted phi (SU) Paral at normal EC (ms/cm) Purise hate Dissolved Oxygen (mg/L) 1015 Callested sample Start de 1115 Decar Completo Depar 1130 arrest at mus 49 - Star 1436 Decar Complete lovered 1438 Decar Complete lovered	07-0 Actual	_	
Or linter well Pumps dry DeloCal Ent. Calibration Time: ph (SU) Paral at normal EC (ms/cm) Pury hate Dissolved Oxygen (mg/L) 1015 Callested sample Start de 1115 Decon Completo Depar 1130 arrest at mus 49 - Star 1436 Decon Completo loverd 1438 Decon Completo loverd 1438 Decon Completo loverd	07-0 Actual	_	ā ģ
paral at normal BC (ms/cm) 1015 Callected sample Start de 1115 Decan Complete Depar 1130 arrived at the 49 - Start 1435 Decan Complete lowerd 1435 Decan Complete lowerd 1435 Decan Complete lowerd	Actual	G-07_	
paral at normal BC (ms/cm) 1015 Callected sample Start de 1115 Decan Complete Depar 1130 arrived at the 49 - Start 1435 Decan Complete lowerd 1435 Decan Complete lowerd 1435 Decan Complete lowerd		-	
person to 121' Calibration Time: and restarted pff (SU) purge at normal EC (ms/cm) purge hate Dissolved Oxygen (mg/L) 1015 Callested sample Start de 1115 Decan Complete Depar 1230 arrived at mu 49 - Start 1435 Decan Complete lowerd 1435 Decan Complete lowerd	Value	Beginning	Ending
person to 121' Calibration Time: and restarted pff (SU) purge at normal EC (ms/cm) purge hate Dissolved Oxygen (mg/L) 1015 Callested sample Start de 1115 Decan Complete Depar 1230 arrived at mu 49 - Start 1435 Decan Complete lowerd 1435 Decan Complete lowerd		Calibration	Callbration
purge at normal BC (ms/cm) purge hate Turbidity (NTU) Dissolved Oxygen (mg/L) 1015 Callected sample Start de 1115 Decar Controleto Depar 1130 arrived at mus 49 - Star 1435 Decar Complete lowerd 1435 Decar Complete lowerd		6740	1530
parge at normal purge rate Dissolved Oxygen (mg/L) 1015 Callested sample Start de 1115 Decar Complete Depar 1330 arrived at mu 49 - 8ta 1436 Decar Complete lovered 1435 Decar Complete lovered	40	3.95	3.79
1015 Callected sample - Start de 1115 Decan Complete Depar 1130 avried at trus 49 - Sta 1435 Decan Complete lowerd 1435 Decan Complete lowerd 1435 Decan Complete lowerd	4.49	4.52	4.48
1015 Callected sample Start de 1115 Decan Complete Depar 1730 arrived at mu 49 - Sta 1436 Decan Complete lowerd 1435 Decan Complete lowerd	0'_	0	0
1115 Decar Complete, Depar 1730 avered at mus 49-8to 1435 Decar Complete lowerd 1445 Startes well purge		1/39	8.90
1115 Decon Complete Depar 1730 arrived at Ann 49-86 1436 Decon Complete lowerd 1848 States well purge	con		
2 12 15 2 2 2 2 2	\$ WZ	-06	<u> </u>
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2 12 15 2 2 2 2 2	pum	15 14.	2.36
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1340 Treat Blvd. Stc. 300 Walnut Creek, CA 94597	Em		(C)

(A) N	ι 19.45 ΛWΗ		MC	NITORING	WELL SAMP	LING LOG		Page	el
All management	HTGOWERY WATS	ON HARZA	a of Corina	□ Brotostii	ua Caalna - F	Ground Lev	al Camala li	WZ-	6-UG
All measure	M Z	-06	pp of Opening	_ riblecti			1/3	35	- 1 -
Well Numbe	4/12/	126			Static Water	333		4	
Date Time Start:_	NEWS	En:	1015		Depth to Pr Total Well i	TO CONTROL	133.7)	
Client AFC	16. <u></u> 1		4 .	 -		/ater Column	~	0.0	
-11-11		wide Groundy	vater Monitori	ing		ethod <u>Modifie</u>		<u> </u>	
Sampler(s).		15 cul -	FILLS						
Sampler(s). Well Diamei			Diameter	X 15-		uipment <u>. 2' G</u> i Il Equipment_	m. ,		
vveli Diamei Screen Inter		oorende	7			n ⊭quipmeni_ neter Meter_	Hori		1-16
Pump Depth		30 0	12	٦.	ORP Meter		ANU	· · · · · · · · · · · · · · · · · · ·	
rump Depir	1 (11)				OHP Weter		77 70		
					T	RS MEASUR			r
3.0	AMOUNT PURGED		5%	1%	5%	10% or <10	5%	10%	
TIME	(gallons)	Purge Bate (gpm)	EC (mS/cm)	Н	Temp (°C)	Turbidity (NTU)	OHP (mv)	(mg/L)	Water Love! (ft)
0845	Star	tel w	ell pu	ngela	1.468	m			113.35
D855	200	147	1592	7.06	23.1	32	228	2.48	115.87
0910	32.5	1.45	.583	7.83	23.7	20	221	2-36	115.65
0930	57.70	1.46	584	295	23.9	17	327	2.10	116.02
0935	7466	7921,46	1.595	7.98	240	20	228	2.14	116.14
		سۇم.		, ,,			8 8		
0950	Res	Larles	we	eca	use	(3)	12 37	27	
0955	1-50	,23	.584	8.03	22.8	12	142	2.18	114.02
1500	2.85	.21	.586	8.00	22.6	14	150	2,29	113.92
1005	3.87	. 22	.582	7.99	23.4	14	192	2.19	113.92
1010	4.35	.22	158K	7.98	2316	14	192	2.16	113.92
1015	Ca	lect	\$ a	mpl	22				<u> </u>
		<u> </u>			<u></u>				
					NING ANALYS	SIS .			
Parameter	Method/Instr	ument Mea	surement 1	Moasureme	nt2 Aver	rege Measuron	nent Dat	e/Time	Sampler
H ₃ S	· ·			<u> </u>				<u> </u>	
Fe²*		<u> </u>		<u> </u>	<u> </u>	<u> </u>		1 1	
Out	-			TIONS OF G	POUNDWATER	SAMPLES			
Color:	Clear	Other (descri							
Odor: Comments:	None	Low N	ledium	High	Fuol-like	Other (desay	ribe):		
Somments:	I ilssef	place	2d on	& for	t fr	m l	ollon	1000	ell
						 			
- - 110 -			_:			·		<u> </u>	<u> </u>
		· · · · · · · · · · · · · · · · · · ·							12-01 GAFB

	NWH			ONTORING T			2000 OO	2300 3 000 300	of
All measure	ments taken	tram: EST	op of Casing		ve Casing E	Ground Lev	el Sample I	7 マメ	-4
Well Numbe	<u>,</u>	1141-4	<u> </u>			er Level (ft)	/_5	110	
Date	4/1	2106		. ~	Depth to Pr	roduct (ft)		7// /-	
Time Start	1441	5 En	15	2	Total Well	Depth (ft)	/60	0 7 6	
Client AFC	7 -				Standing W	Vater Column	(fl)	2 4.	
Project Gan	rge AFS Base	wide Ground	ester Monitor	ing	Purging Me	thod <u>Modifie</u>	d Milatopurde	20000	
Sampler(#)	mu	NOSCA		-15	Purging Eq	utpment_20	nundfas Redit	ION	
Well Clame	er 40'	Sarehok	Diameter	12"	Water Love	i Equipment,		N 57	
Screen Inte	rvai 12	0-100	<u> </u>	<u>-</u> -	Field Paran	meter Meter_		BA	11-16
Pump Depti	(A) / 44	2.30			ORP Meter	<i></i>	40 NN	A	
		2007		FIELD	PARAMETE	as Measur	ED		
	AMOUNT	- 1	5%	1%	5%	10% or <10	5%	10%	
TIME	FURGED (gallons)	Purpe Rate (gpm)	(mS/cm)	рН	Tagys	Turbletty (NTV)	ORP (mv)	(me/L)	Water Lov (ft)
1445	Ma	tel h	ull	Aure	20	.35	GPW		<u> </u>
1450	4.25	.34	.700	8.30	343	24	227	7.20	138,9
1435	5.51	.28	752	8.39	24.7	13	155	6.60	138.5
1560	696	.26	1832	8.42	24.8	9	189	6.33	1389
1505	8.09	.76	.837	8:42	24.9	9	190	C.28	138.9
1510	9.32	. J	-834	8.43	35.1	8	19/	6.31	138.5
1515	Cing	Re	com 5		pla		n - At		
	\$5				!		<u> </u>		
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	33323								
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		9.0							
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				ield screet	ING ANALYS	ijs			
Paramotor	Method/Instr	emont Map	suremont 1	Monaurente	ni 7 Aven	позиецаМ арк	ent Dat	a/Tima	Sampler
H ₂ S									
. Fo ² *									
			CHSERVA	пона се ся	OUNDWATER	SAMPLES	50 - 9555A75590 - 124		
Cotor:	Cles/	Other (descri	baj:						
Odor: (Ngoa	Low M	odjum	H)gh J	uol-like	Other (deser	that:		

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GEORGE AIR FORCE BASE SAN BERNARDING COUNTY, CALIFORNIA MONITORING WELL SAMPLING LOG

FIGURE. 8-1

05-03 GAFB

1000 A

Chain-of Custody Records

ØIT.	Generic	Chain	Generic Chain of Custody	Program				Reference Client No:	Case: 35220	ァ
Region: Project Code:	ю			Date Shipped:	4/12/2006		Chain of Custody Record	Record	Sampler Signature	
Account Code:		•		Airbill:	8451 9856 9820	20	Relinquished By	(Date / Time)	Received By	(Date / Time)
Sell ID:	CA2570024453	453		Shipped to:	EPA Region 9 Laboratory	Laboratory	, T			
Site Name/State:		Force Bas	e/CA		Building 201	oth Street,	2			
Action:	Greg Nagle Combined RI/FS	SHES			(510) 412-2377	7	Ç	A Control of the Cont		
Sampling Co:	EPA Region 9 Laboratory	n 9 Laboret	tory				4			1 to
SAMPLE No.	MATRIX/ SAMPLER	CONC	ANALYSIS/	TAG No./ PRESERVATIVE/ Bottles	No./ NE/ Bottles	STATION LOCATION	SAMPLE DATE	SAMPLE COLLECT DATE/TIME		3. gk.
YZFX6	Ground Water/ Greg Nagle	υG	ALK & NO3 (21) 151 (loe Only) (1)	151 (Ice Only) (1)	MW-200	S: 4/12/2006	14:00		PE

MZ-06

\$: 4/12/2006 10:15

Shipment for Case Complete? N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
	Y2FX7		·
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment load?
ALK B NOS - Allesians.		The inflations of the contract of	לוווסווופוע ועפעו
ATT OF HOS - MICHINE	run a 1903 - Paraminy & Nibate, 100 - 10tal Olganic Carpon		
TR Number: PR provides preliminary res	TR Number: 9-265062414-041206-0002 PR provides preliminary results. Requests for preliminary results, will increase analytical costs.	55.5	REGEN COPY
Send Copy to: Sample M	anagement Office, Attn: Heather Bauer, CSC, 15000 Confe	Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax 704/644 4600	F2V5.1.047 Page 1 of 1

Ç	EPA USEPA
gaine maine report or criain of castray kecusa	EPA USEPA Contract Laboratory Program
DAS No:	Case No:

Organic Traffic Report & Chain of Cus	Organic	Traffic Ro	eport & Ch	Organic Traffic Report & Chain of Custody Record	dy Record			Case No: DAS No:	35220	
Region: Project Code:	• •Ф			Carrier Name: F	4/10/2006		Chain of Custody Record	Record	Sampler Signaturu:	
Account Code:	8 8				8451-9856-9771		Relinguished By	(Date / Time)	Received By	
Spill ID:	CA2570024453	8		Shipped to: A	A4 Scientific		1			
Site Name/State:	55	George Air Force Base/CA		· so =	Suite 505	8	2			
Action:	Greg Nagle Combined Ri/FS	WES		s:	(281) 292-5277	X / / 300	6			
Sampling Co:	€PA Region	EPA Region 9 Laboratory					4			
ORGANIC SAMPLE No.	MATRIX	TAPE	ANALYSIS TURNARCUND	TAG No./ PRESERVATIVE Bolles	Bollies	STATION	SAMPLE	SAMPLE COLLECT	INORGANIC SAMPLE No.	Self.
YZFX1 C	Ground Water/ Greg Negle	ГG	VOA (21)	112 (HCL), 113 (HCL), 114 (HCL), 115 (HCL), 116 (HCL), 117 (HCL), 116	CL), 114 116	NZ-107	S: 4/10/2006	11:15		1

Shipment for Case	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Kumber:
	Y2FXt		
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	TyperDesignate: Composite = C, Greb = G	Shipment iced?
VOA = CLP TCL Volatiles			
TR Number:	TR Number: 9-265062414-041006-0001 PR provides meliminary results. Requests for preliminary results will increase analytical costs.	205(5.	REGION COP
Send Copy to: Sample Ma	anagement Office, Attn: Heather Bauer, CSC, 15000 Conf	Send Copy to: Sample Management Office, Atm: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 704/814.4300; Fax	F2V5.1.047 Page 4

ÿEPA	
USEPA Contract Laboratory Program Generic Chain of Custody	

		Chain	Generic Chain of Custody	ı			13	Client No:	Case: 35220	刀
Region: Project Code:	- 6			Date Shipped: Carrier Name:	4/10/2006 FedEx	a Turno	Chain of Custody Record	Record	Sampler Signature:	
Account Code:				Airbill:	8451-9856-9762	762	Relinquished By	(Date / Time)	Received By	(Date / Time)
Spill ID:	CA2570024453	153		Shipped to:	EPA Region 9 Laboratory	8 Laboratory	-			
Site Name/State:		Seeg solo	ÿC.A		Building 201	our aneer,	2			
Action:	Greg Nagle Combined RI/FS	SHI			(510) 412-2377	77	ပ			
Sampling Co:	EPA Region 9 Laboratory	9 Laborat	ary				4			
SAMPLE No.	MATRIX/ SAMPLER	TAPE:	ANALYSIS TLESALARGUID	TAGNOJ PRESERVATIVEJ SODIOS	Securities	STATION	DA PA	SAMPLE COLLECT	1	8 18
Y2FX1	Ground Water	D.C.	Anions & T (21)	121 (lœ Only), 122 (lœ	22 (lice	NZ-107	S: 4/10/2006 11:15	11:15		

Complete? N	Sample(s) to be used for laboratory QC:	laboratory QC:	Additional Sampler Signature(s):	er Signature(s):	Chain of Custody Seal Number:
	YZFX1		·····		
Analysis Key:	Concentration: L=Lo	Concentration: L = Low, M = LowMegium, H ≈ High	Type/Designate:	TyperDesignate: Composite = C, Grab = G	Shipment load?
Anions & T = Anions & TDS	TDS				***
TR Number: 9-265062414-041006-0002 PR provides preliminary results. Requests for preliminary results will increase at the control of the second Copy to: Sample Management Office. Afth. Heather Bound Copy to: Sample Management Office.	9-265062414- suits. Requests for prelimit lanagement Office. Affin: I	TR Number: 9-265062414-041006-0002 PR provides preliminary results. Requests for preliminary results will increase enalytical costs. Send Copy to: Sample Management Office. Afth: Heather Barray TSC: 15000 Conference.	State Conforting	Postille VA 20484 2040; 755 703040 4000 1	MOLON COLA
znazoko vevo	lanagement Office, Attn: I	Heather Bauer, CSC, 15000 Confer	ence Center Dr., C	Serio Copy to: Sample Management Office, Aftr. Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3819; Phone 703/818-4200; Fax	F2V5.1.047 Page 1 of 1

Region: 9	organic manac report & criain of custody Record	SEPA USEPA Contract Laboratory Program	
Data Shipped:	Cilain of Custody Record	ary Program	
Chain of Custody Borond			
1	DAS No:	Case No:	
Sampler		35220	

⊘ EFA	Organic	Traffic	rganic Traffic Report & Chain of Cu	Organic Traffic Report & Chain of Custody Record	/ Record		Case No:	35220	70
Region:	g	8		Date Shipped: 4/11	4/11/2006	Chain of Custody Record	Record	Sampler	
Project Code:					7			Signature:	
Account Code:					BA45 0050 0000	Relinquished By	(Date / Time)	Received By	(Date / Time)
CERCUS ID:	CA2570024453	453			2 2000 2000	•		1	, , , , , , , , , , , , , , , , , , , ,
Spill ID:	Q7			Supped to: A4 :	1544 Sawdust Road				
Site Name/State:		George Air Force Base/CA	Ω	Suit	Suite 505	2			٠
Project Leader:	Greg Nagle			The	The Woodlands TX 77380	· C			
Action:	Combined RUFS	SHA		[25]	7170-787 (107)	· c			82
Sampling Co:	EPA Region	EPA Region 9 Laboratory	y		1000	4			8
ORGANIC SAMPLE No.	MATRIX/ SAMPLER	TYPE	ANALYSIS' TURNAROUND	TAG NOJ PRESERVATIVEJ Bottles	STATION LOCATION	SAMPLE DAT	SAMPLE COLLECT	INORGANIC SAMPLE No.	QC Type
Y2FW8	Ground Water/ Greg Nagle	L/G	VOA (21)	103 (HCL), 104 (HCL), 105 (HCL) (3)	, 105 FT-03	S: 4/11/2006	8:50		T.
Y2FW9	Ground Water/ Greg Nagle	6	VOA (21)	106 (HCL), 107 (HCL), 108 (HCL) (3)	, 108 MW-69	S: 4/12/2006	15:00		Ē
Y2FX2	Ground Water/ Greg Nagle	5	PEST (21)	124 (Ice Only), 125 (Ice Only), 126 (Ice Only), 127 (Ice Only), 128 (Ice Only),	보 NZ- 69 127 nly),	S: 4/11/2006	11:10		1
Y25X4	Fleid QC/ Greg Nagle	₽ <mark>G</mark>	VQA (21)	145 (HCL), 146 (HCL), 147 (HCL)-(3)	, 147 04112006TB	TB S: 4/11/2006	15:15	-82 -82 163	Trip Blank

Complete? N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
	Y2FX2		S
Analysis Key:	Concentration: L = Low, M = Low/Medium, H = High	Type/Designate: Composite = C, Grab = G	Shipment load?
PEST = CLP (CL Pesti	PEST = CLP (CL Pesticide/PCBs, VOA = CLP TCL Volatiles		
TR Number: PR provides preliminary res	TR Number: 9-265062414-041006-0003 PR provides preliminary results. Requests for preliminary results will increase analytical costs.	est.	MEGION COPY
Send Convior Sample M.	anagement Office Attn. Heather Railer OSC 45000 Confer	Send Copy to: Sample Management Office Attn. Heather Reserve Copy Angol Copy to: Chaptile, VA 2015, 2010, December 2010, 1910	Capita and D

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Organic Traffic Report & Chain of Custody Reco	O USERA CONTract Laboratory Program
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Region:	Organic Traffic Report & Chain of Custody Record	taboratory teport & Ch	nain of Custo	ody Record	0.500.64		2	Case No.	No: No:
Region: Project Gode:	9		Date Shipped: Carrier Name:	4/10/2006 FedEx		; ; ;	in of Custody	Chain of Custody Record	in of Custody Record Sampler Signature:
Account Code:				8451 9856 9771	m.l	£Ι	Relinquished By		inquished By (Date / Time) Received By
Spill ID:	CA2570024453		Shipped to:	A4 Scientific	i	- :			
Ske Name/State:	38	Þ	3300	Suite 505	Jac.	N			
Project Leader: Action:	Greg Nagle Combined RI/FS			(281) 292-6277	X 77380	ω			
Sampling Co:	EPA Region 9 Laboratory	1				4			
ORGANIC SAMPLE No.	MATRIX/ CONC/	ANALYSIS	TAG No./ PRESERVATIVE/ Bottles	i Bothes	STATION		SAMPL	SAMPLE COLLECT	SAMPLE COLLECT INORGANIC DATE/TIME SAMPLE No.
Y2FX3	Field QC/ L/G	VOA (21)	142 (HCL), 143 (HCL), 144	(CL), 144	04102006TB		S: 4/10/2006	S: 4/10/2006 13:30	S: 4/10/2006 13:30

Shipment for Case Complete ? N	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
Analysis Key:	Concentration: L=Low, M = LowMedium, H = High	Type/Designate: Composite = C, Grab = G	Shipment loed?
VOA = CLP TCL Volatiles	95		
TR Number: 1	TR Number: 9-265062414-041106-0002 PR provides preliminary results. Requests for preliminary results will increase analytical costs.	N STATE OF THE STA	Adon Noider
Send Copy to: Sample Ma	anagement Office, Attn: Heather Bauer, CSC, 15000 Confe	Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chantilly, VA 20151-3619; Phone 703/818-4200; Fax narror	F2V5.1.047 Page 1 of 1

BEE GRAS	Region: 9 Date Shipped: 4/12/2006 Chain of Custody Record Project Code: FedEx	*EPA USEPA Contract Laboratory Program Organic Traffic Report & Chain of Custody Record
8451 9856 9808 Relinquished By		ly Record
(Date / Time)	tody Record	Case No: DAS No:
Received By	Sampler Signature:	35220
(Date / Time)	85 N	R

	* Organic	Traffic R	Organic Traffic Report & Chain of Custody Record	lain of Cust	body Reco	ā		Case No.	Ş	3220	T
			•					DAS No:			
Region: Project Cade:	. ro			Date Shipped: Carrier Name:	4/12/2006 FedEx		Chain of Custody Record	Record	ss ss	Sampler Signature:	E N
Account Code:				Airbill:	8451 9856 9808	8	Relinquished By	(Date / Time)		Received By	(Date / Time)
Spill ID:	CA2570024453 Q7	53		Shipped to:	A4 Scientific	Road					
Site Name/State:	George Air f	George Air Force Base/CA	Þ	••	Suita 505		8				
Project Leader: Action:	Greg Nagle Combined RUFS	WES	19		The Woodlands TX 77380 (281) 292-5277	15 TX 77380	3				
Sampling Co:	EPA Region	EPA Region 9 Laboratory	9230		0.00		4				
ORGANIC SAMPLE No.	MATRIX	TYPE	ANALYSIS!	TAG NOJ PRÆSERVATIVEI Bottles	lo./ VE/ Broffles	LOCATION	SAMPLI	SAMPLE COLLECT DATE/THIC	INORGANIC SAMPLE No.	No.	QC Type
YZFW7 C	Ground Water/ Greg Nagle	M/G	VOA (21)	100 (HCL), 101 (HCL), 102 (HCL) (3)	(HCL), 102	NZ-27	S: 4/12/2006	12:25			1
Y2FX0 C	Ground Water/ Greg Nagle	MG	VOA (21)	109 (HCL), 110 (HCL), 111 (HCL) (3)	(HCL), 111		S: 4/12/2006	15:15			1
Y2FX5 F	Field QC/ Greg Nagle	<u> </u>	VOA (21)	148 (HCL), 149 (HCL), 150 (HCL) (3)	(HCL), 150	04122006TB	S: 4/12/2006	15:00		7	Trip Blank
Y2FX6	Ground Water/ Greg Nagle	5	VOA (21)	155 (HCL), 156 (HCL), 157 (HCL) (3)	(HCL), 157	MW-200	\$: 4/12/2006	14:00	je:		EN P
Y2FX7 G	Ground Water/ Greg Nagle	ĽG	VOA (21)	139 (HCL), 140 (HCL), 141 (HCL) (3)	(HCL), 141	WZ-06	S: 4/12/2006	10:15			Ĵ

Complete? N	Sample(s) to be	Sample(s) to be used for laboratory QC:	Additional Sampler Signature(s):	Chain of Custody Seal Number:
			50	
Analysis Key:	Concentration:	Concentration: L = Low, M = Low/Medium, H = High	TypeChesignate: Composite = C, Grab = G	Shipment ked?
VOA = CLP TCL Volatiles	des .	NO. 100		
PR provides preliminary re	9-265062	IR Number: 9-265062414-041106-0003 FR provides prelimitary results. Requests for preliminary results will increase analytical costs.	20445.	REGION COPY
Send Copy to: Sample N	Management Office	s, Attn: Heather Bauer, CSC, 15000 Conf.	Send Copy to: Sample Management Office, Attn: Heather Bauer, CSC, 15000 Conference Center Dr., Chandilly, VA 20151-3819, Phone 703/918-4200; Fax	FZV5.1.047 Page 1 c